Unplanned Ignitions for Restoration of Whitebark Pine

Desired Conditions, Objectives, and Management Approaches

Objective: Promote whitebark pine survival, regeneration and rust-resistant gene conservation over the 6 million acre range in Region 1 (of which only 860,000 acres are currently dominated by whitebark) for ecological diversity, wildlife, hydrologic and other benefits.

Desired Conditions:

Species composition

Stands dominated by lodgepole pine, subalpine fir and spruce are the highest priority for treatment. The goal is to reduce these species in the understory and overstory, and increase whitebark pine. Burning will promote the regeneration of whitebark pine, thin stands and reduce the competition from subalpine fir, lodgepole pine and spruce.

Stocking or crown closure

Whitebark pine seeds are dispersed by Clark's nutcrackers and regenerate successfully when crown closure is 30 percent or less. Opening up whitebark pine stands to a maximum of 30 percent closure (or <175 sq. ft./acre basal area) with openings ~1/2 acre will aid in the regeneration of seedlings. Ideal structure would be open conditions with clumps of mature, immature or sapling whitebark pine with seedlings eventually filling in openings with reduced surface fuels and mineral soil exposed.

Management Approaches:

Burn Conditions

Moderate years (when fire severity conditions are not extreme) have great potential to create the desired conditions described. Examples of moderate conditions might include shoulder seasons, a trend of low ERCs for the season or where seasonal severity indicators are acceptable based on risk assessment. Often, a heavy frost in late summer/early fall will kill and dry out fine fuels, facilitating fire spread.

Resource Benefit Fire Areas

The map on the linked site (ftp://ftp.r1.fs.fed.us/pub/open/Whitebark_Pine_Fire/) shows those areas where fire for resource benefits is allowed with pertinent operational details identified in Fire Management Plans or elsewhere. The light green areas do not yet have operational details documented, but may have potential for the future.

Blister Rust

Where blister rust has caused extensive mortality of whitebark pine (blue color on map at ftp site), burning will be essential to promote rust resistant whitebark over other species. Areas with > 50 % whitebark pine mortality over a majority of an area are the highest priority for burning. However, if there are possible rust resistant trees (pole size or greater whitebark pine survivors of blister rust), use caution to avoid killing them. Regeneration from these individuals is essential – it is critical that this important genetic resource not be completely lost to fire. There are also cone collection plus trees (see map) that are important to protect. In addition, fires in lower elevations below whitebark pine areas can create a landscape mosaic of fuel breaks to help protect rust resistant stands, as well as expand its current range.

Mountain Pine Beetle
Where mortality due to mountain pine beetle is high in southern part of WBP range, (see maps at ftp site) complete stand-replacement by fire is acceptable.

Fire History
Recent fires (see maps) could provide fuel breaks for adjacent whitebark pine areas in need of fire. Fire history maps could also help identify and prioritize areas in need of fire. Those areas without fire in the past 2 decades and in spruce and subalpine fir habitats types will be a higher priority for fire.

Pure Stands of Whitebark Pine versus Mixed Species Stands
Stands mixed with spruce, lodgepole pine and subalpine fir (where whitebark pine has been a seral species) are good candidates for stand replacing or mixed severity fire to increase desired regeneration. Areas of pure, live whitebark pine are less in need of stand replacing fire, but can benefit immensely from surface fire to reduce fuels.